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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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7590 04/22/2004			EXAMINER	
Monte L. Falcoff Harness, Dickey & Pierce, P.L.C. P.O. Box 828 Bloomfield Hills, MI 48303			OMGBA, ESSAMA	
			ART UNIT	PAPER NUMBER
			3726	

DATE MAILED: 04/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/862,688	MAUER ET AL.	
	Examiner	Art Unit	
	Essama Omgba	3726	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-77 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-77 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>12/15/2003</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 2, 4, 6, 7, 9, 12, 13, 15, 20, 21, 50, 53 and 54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Speller, Jr. et al. (US Patent 5,829,115) in view of IBEC (Body Assembly & Manufacturing, September 1994).

With regards to claims 1, 2, 6, 9, 12, 13, 50 and 53, Speller, Jr. et al. discloses an electronic control system for use in a riveting process, the system comprising a rivet and a riveting machine, an electronic control unit 506, an electronic motor connected to the electronic control unit, wherein a force to be applied during the riveting process may be precisely computer-controlled, and the velocity of the electric motor is determined, a sensor 510 connected to the electronic control unit, the sensor operably detecting a riveting characteristic occurring during the riveting process, one of the riveting characteristics being the output shaft location, see column 4, lines 25-38, column 7, lines 20-67, column 8, lines 1-35 and 49-53, and column 9, lines 4-56. Although Speller, Jr. et al. does not specifically disclose two distinct sensors, however IBEC teaches an in-process monitoring used in an electrical self-piercing riveting process wherein process parameters such as joint thickness, applied force rivet shank length, force/velocity characteristic are continuously monitored during the riveting process, see

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pages 4, 5 and 7. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have used the monitoring system of IBEC in Speller, Jr. et al.'s electronic control system, in order to achieve superior rivet joints.

Applicant should note that using a stationary die always aligned with the punch is an obvious matter of design choice wherein no stated problem is solved or unexpected results obtained in using a substantially stationary die versus the type taught by Speller, Jr. et al. Furthermore many of the prior arts made of record in the instant application disclose the combination of a substantially stationary die always aligned with a punch.

For claim 4, see column 5, lines 23-29 and 49-64 of Speller, Jr. et al.

For claim 7, see column 9, lines 4-10, 20 and 21 of Speller, Jr. et al.

For claim 15, see column 5, lines 23-29 and 49-64 of Speller, Jr. et al.

For claim 20, see column 7, lines 44-54 of Speller, Jr. et al.

For claim 21, see column 7, lines 20-25 of Speller, Jr. et al.

For claim 54, Applicant should note that the joint quality is monitored in the IBEC monitoring system, see page 5 particularly. It would have been obvious to one of ordinary skill in the art at the time the invention was made that a good quality joint will require among other things the head of the rivet being essentially flush with the punch-side workpiece outer surface without completely piercing through the die-side workpiece, see figure 15 of IBEC for example.

3. Claims 3, 8, 14, 51 and 52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Speller, Jr. et al./IBEC as applied to claims 2, 13 and 50 above, and further in view of Gast (US Patent 4,901,431).

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With regards to claims 3, 8, and 14, Speller, Jr. et al./IBEC discloses an electronic control system as shown above except for a rivet feeder connected to the electronic control unit, a feed tube sensor wherein the rivet size is sensed by the sensor and an articulating robot attached to and positioning the riveting machine. However Gast teaches such rivet feeder and robot, see columns 13 and 14. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have incorporated a rivet feeder and an articulating robot to the system of Speller, Jr. et al./IBEC, in light of the teachings of Gast, in order to facilitate transfer of the rivet and enhance the rivet installation process.

For claims 51 and 52, Applicant should note Gast's electrical control unit transmits error signals and stops the rivet process if an undesired condition is present.

4. Claims 5 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Speller, Jr. et al./IBEC as applied to claims 4 and 15 above, and further in view of Zeldman et al. (US Patent 3,878,734).

Speller, Jr. et al./IBEC discloses an electronic control system as shown above except for the transmission including a closed loop belt. However it is known to use closed belt loops in power transmissions as attested by Zeldman et al., see column 3, lines 34-36. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a closed loop belt in the transmission of Speller, Jr. et al./IBEC, in light of the teachings of Zeldman et al., in order to provide a highly power transmission capable of being inexpensively manufactured.

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5. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Speller, Jr. et al./IBEC as applied to claim 1 above, and further in view of Gerlach et al. (US Patent 5,679,882).

Speller, Jr. et al./IBEC discloses a system as shown above except for the sensor being a load cell sensor. However it is known to use load cell sensors for indicating a linearly moving member force as attested by Gerlach et al., see column 1, lines 17-26. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have used a load cell sensor, in the system of Speller, Jr. et al./IBEC, in light of the teachings of Gerlach et al., in order to assure exact force application.

6. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Speller, Jr. et al./IBEC as applied to claim 1 above, and further in view of Smart et al. (US Patent 4,988,028).

Speller, Jr. et al./IBEC discloses a system as shown above except for the sensor being a proximity switch sensor. However it is known to use proximity switch sensors in riveting systems as attested by Smart et al., see column 1, lines 38-42 and 65-68. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have used a proximity switch sensor in the system of Speller, Jr. et al./IBEC, in light of the teachings of Smart et al., in order to appropriately sense the existence of rivets for instance.

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7. Claims 22-30, 33, 34, 43, 44, 56, 57, and 59-61 are rejected under 35 U.S.C. 103(a) as being unpatentable over Speller, Jr. et al. in view of Cotterill (US Patent 5,752,305).

With regards to claims 22-26, 29, 30, 33, 34, 43, 44, 56 and 61, Speller, Jr. et al. discloses an electronic control system for use in a riveting process, the system comprising a rivet and a riveting machine, an electronic control unit, an electric motor connected to the electronic control unit and sensors connected to the electronic control unit and the electric motor, the sensors indicating various characteristics of the electric motor and various riveting characteristics, the electronic control unit being a programmable computer, see column 2, lines 24-31, column 7, lines 20-23 and 42-54 and column 8, lines 17-35. Speller, Jr. et al. does not disclose the rivet as being a self-piercing rivet operably driven by a punch as controlled by an electrical control unit, and a die operably diverging an end of the rivet without the rivet piercing completely through the exterior surface of a die-side workpiece adjacent the die, the die acting with a substantially relatively stationary die, the rivet being of a hollow and diverging type with a solid head. However Cotterill et al. teaches such rivet, punch and die assembling, see column 2, lines 27-49 and figures 1-3. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have incorporated the control system of Speller, Jr. et al. with the rivet and die system of Cotterill et al., in order to improve the riveted joint produced. Applicant should note that it is inherent that a data monitoring system is used with the system of Speller, Jr. et al.

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For claim 27 and 28, Applicant should note that the position of the electric motor is an obvious matter of design choice.

For claim 57, Applicant should note that such system is conventional in the art.

For claim 59, Applicant should note that circulating ball spindle used in a riveting machine transmission is old and well known to those of ordinary skill in the art.

For claim 60, Applicant should note that having the rotational axis of the motor to be offset from an elongated center line of the plunger is an obvious matter of design choice.

8. Claims 31, 32, 35-42 and 45-47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Speller, Jr. et al./Cotterill et al. as applied to claims 22, 34 and 43 above, and further in view of Gast (US Patent 4,901,431).

With regards to claims 35-40, 45 and 46, Speller, Jr. et al./Cotterill et al. discloses an electronic control system as shown above except for a rivet feeder connected to the electronic control unit, a feed tube sensor wherein the rivet size is sensed by the sensor and an articulating robot attached to and positioning the riveting machine. However Gast teaches such rivet feeder and robot, see columns 13 and 14. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have incorporated a rivet feeder and an articulating robot to the system of Speller, Jr. et al./Cotterill et al., in light of the teachings of Gast, in order to facilitate transfer of the rivet and enhance the rivet installation process.

For claims 31, 32, 41, and 42, Applicant should note that Gast electrical control unit transmits error signals and stops the rivet process if an undesired condition is present.

For claim 47, the use of an endless belt is an obvious matter of design choice that is equivalent to Speller, Jr. et al.'s reduction gears mechanism.

9. Claim 48 is rejected under 35 U.S.C. 103(a) as being unpatentable over Speller, Jr. et al. in view of IBEC and Gast.

Speller, Jr. et al. discloses an electronic control system for use in a riveting process, the system comprising a rivet and a riveting machine, an electronic control unit, an electric motor connected to the electronic control unit and sensors connected to the electronic control unit and the electric motor, the sensors indicating various characteristics of the electric motor and various riveting characteristics, the electronic control unit being a programmable computer, see column 2, lines 24-31, column 7, lines 20-23 and 42-54 and column 8, lines 17-35. Speller, Jr. et al. does not disclose the sensor operable to indicate a riveting force, a rivet feeder connected to the electronic control unit, a feed tube sensor wherein the rivet size is sensed by the sensor and an articulating robot attached to and positioning the riveting machine. However it is known to monitor a riveting force in a riveting process as attested by IBEC, see pages 4, 5 and 7. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have monitored the riveting force in Speller, Jr. et al.'s riveting process, in light of the teachings of IBEC, in order to provide appropriate riveting force to the joint being made. Applicant should note that it is within the general knowledge of one of ordinary skill in the art to use a sensor in monitoring the riveting force. Gast on the other hand teaches such rivet feeder and robot, see columns 13 and 14. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made,

to have incorporated a rivet feeder and an articulating robot to the system of Speller, Jr. et al./IBEC, in light of the teachings of Gast, in order to facilitate transfer of the rivet and enhance the rivet installation process.

10. Claims 49 and 55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Speller, Jr. et al./IBEC/Gast as applied to claim 48 above, and further in view of Cotterill et al.

For claim 48, Speller, Jr. et al./IBEC/Gast teaches a control system as shown above except for the rivet having a solid head and a diverging open end which does not completely penetrate a workpiece farthest from the head. However Cotterill et al. teaches such rivet, see figures 1-3. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have used the rivet of Cotterill et al, in Speller, Jr. et al./IBEC/Gast's control system in order to avoid unevenness in the thickness of the sheet material encapsulating the rivet.

For claim 49, Applicant should note that the joint quality is monitored in the IBEC monitoring system, see page 5 particularly. It would have been obvious to one of ordinary skill in the art at the time the invention was made that a good quality joint will require among other things the head of the rivet being essentially flush with the punch-side workpiece outer surface without completely piercing through the die-side workpiece, see figure 15 of IBEC for example.

11. Claim 58 is rejected under 35 U.S.C. 103(a) as being unpatentable over Speller, Jr. et al./Cotterill et al as applied to claim 57 above, and further in view of the Affidavit of John Vrana (Vrana).

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Speller, Jr. et al./Cotterill et al. discloses a system as shown above except for the plunger and the clamp movable together at a first speed during advancement, and the plunger is subsequently movable at a second speed slower than the first speed when the clamp is substantially stationary during rivet-to-workpiece engagement. However such system is known as attested by Vrana. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used the system of Vrana with the system of Speller, Jr. et al./Cotterill et al., in order to ensure good quality joints.

12. Claim 62 is rejected under 35 U.S.C. 103(a) as being unpatentable over Speller, Jr. et al./Cotterill et al. as applied to claim 56 above, and further in view of IBEC and Gast.

Speller, Jr. et al./Cotterill et al. discloses a system as shown above except for a sensor operable to detect at least one of clamp travel, plunger advancing force, clamp advancing force, etc, and a robotic arm coupled to the frame. However IBEC teaches a monitoring system to monitor the applied force during the riveting process, see pages 4, 5 and 7. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have used the monitoring system of IBEC in Speller, Jr. et al./Cotterill et al.'s electronic control system, in order to achieve superior rivet joints. Applicant should note that using a die always aligned with the punch is an obvious matter of design choice wherein no stated problem is solved or unexpected results obtained in using a die always aligned with the plunger versus the type taught by Speller, Jr. et al. Furthermore many of the prior arts made of record in the instant

application disclose the combination of a substantially stationary die always aligned with a punch. Gast on the other hand teaches such robot, see columns 13 and 14. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have incorporated an articulating robot to the system of Speller, Jr. et al./Cotterill et al./IBEC, in light of the teachings of Gast, in order to enhance the rivet installation process.

13. Claims 63 and 71 are rejected under 35 U.S.C. 103(a) as being unpatentable over Speller, Jr. et al. in view of Cotterill et al. and Vrana.

Speller, Jr. et al. discloses an electronic control system for use in a riveting process, the system comprising a rivet and a riveting machine, an electronic control unit, an electric motor connected to the electronic control unit and sensors connected to the electronic control unit and the electric motor, the sensors indicating various characteristics of the electric motor and various riveting characteristics, the electronic control unit being a programmable computer, see column 2, lines 24-31, column 7, lines 20-23 and 42-54 and column 8, lines 17-35. Speller, Jr. et al. does not disclose the rivet as being a self-piercing rivet operably driven by a punch, and a die operably diverging an end of the rivet without the rivet piercing completely through the exterior surface of a die-side workpiece adjacent the die. However Cotterill et al. teaches such rivet, punch and die assembling, see column 2, lines 27-49 and figures 1-3. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have incorporated the system of Speller, Jr. et al. with the rivet and die system of Cotterill et al., in order to improve the riveted joint produced. Although Speller, Jr./Cotterill et al.

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does not disclose a movable clamp connected to the transmission, the movable clamp and a member coupled to the transmission initially movable together at a first speed and the plunger movable at a second speed, however such arrangement is known as attested by Vrana. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used the system of Vrana with the system of Speller, Jr. et al./Cotterill et al., in order to ensure good quality joints.

14. Claims 64-70 and 71-77 are rejected under 35 U.S.C. 103(a) as being unpatentable over Speller, Jr. et al./Cotterill et al./Vrana as applied to claim 63 above, and further in view of IBEC.

IBEC has been discussed above. It is within the general knowledge of one of ordinary skill in the art to use appropriate sensors and monitoring units as outlined in the above rejections.

Response to Arguments

15. Applicant's arguments with respect to claims 1-21 and 50-53 have been considered but are moot in view of the new ground(s) of rejection.

Applicant other arguments have previously been addressed.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Essama Omgba whose telephone number is (703) 305-2915. The examiner can normally be reached on M-F (10-7:30) First Friday off.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Peter Vo can be reached on (703) 308-1789. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

eo
April 19, 2004

A handwritten signature in black ink, appearing to read "J. M. [unclear]".